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ABSTRACT

The sequence of prelinguistic patterns in the infant and young child is described and explained to aid in identifying the nonverbal child's level of signal and symbol communication. Child-object and child-adult interactions are grouped into the following levels (with sample characteristic behaviors in parentheses): sensation (ceasing crying upon hearing human voices), perception (responding differentially to adults by babbling more frequently in the mother's presence), association (intentionally manipulating objects in an exploratory manner), imagery (pointing toward desired objects), and symbolism (pretending to play and imitating previously seen behavior). (CL)

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ASSESSING COMMUNICATION IN NONVERBAL CHILDREN

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ASSESSING COMMUNICATION IN NONVERBAL CHILDREN

Children without verbal communication skills have been considered difficult to test by psychologists and diagnosticians. A few nonverbal intelligence measures, namely, the Pictorial Test of Intelligence, (French, 1964), Columbia Mental Maturity Scale (Burgemeister, Blum & Forge, 1972), Leiter International Performance Scale (Leiter, 1946), and the Peabody Picture Vocabulary Test (Dunn, 1959) have been used by examiners when faced with nonverbal children. These tests require cognitive skills (same-different concept) or receptive language (pointing to an auditory stimulus), behaviors seldom in the repertoires of nonverbal children being seen in ever increasing numbers in diagnostic centers across the country. Numerous efforts (Uzgiris & Hunt, 1974; Kiernan & DuBose, 1974; Robbins, 1974; DuBose & Langley, 1976) are being made to develop procedures for assessing cognitive and adaptive development in nonverbal children, but little has been done to assess early language behavior in this population. If progress is to be made in helping nonverbal or preverbal children acquire a means of communicating with those around them, then prelinguistic behavior must be carefully explored and systematic procedures for determining the sequence of early communication patterns delineated. The purpose of this paper is to examine early developing communication patterns and to suggest procedures for assessing these basic skills.

Communication and Language

Communication is the passing of meaning from one source to another. The meaning communicated can be in signals or smybols. Signals are carriers of meaning at a sensation or perceptual level. They signify some action

to be taken or a situation to be noted. Four components are required: a sender, a receiver, a message and a means to convey the message. If the communicative intent is to be received, the recipient must understand what the signal represents. It takes place through the movement of male spiders, the displays of birds, the cries of babies, the smiles of infants, the pointing of children and the talk, touch and facial expressions of all of us. Children communicate first by signalling, then progress to a symbol level. Some children never reach the symbol-language level, but they do develop a signal system that permits them to communicate with those around them. The content of their signal communication is limited to their physical needs. These very primitive signal communicative exchanges contain many essential elements for the development of symbolic language, and permit one to foresee the emerging language system.

Carrow (1972) defined language as "an arbitrary system comprised of sets of vocal symbols which represent a conceptual system used by man to communicate (p. 54)". The uniqueness of language as communicative behavior is its symbolic quality. A symbol represents an idea, a place, an experience, but is not tied to the immediate perceptual event. Words are arbitrary verbal symbols that signify certain thoughts, reactions, experiences and events. Symbols are not only perceived at a sensory perceptual level, but are to be comtemplated. A word becomes a symbol for a child when it is no longer dependent upon an immediate perceptual event for its meaning: the word is sufficient to recall the idea place or experience it represents. One is a language user when he communicates to those around him through a symbol system which operates functionally in his environment. This system is more frequently a verbal system, however the

use of nonverbal signs to communicate on a sharing basis fully qualifies as a symbolic means of communication. By identifying in early interactions those behaviors carrying signal or symbolic messages, a guideline is provided for observing and assessing a child's early communicative development.

Representations of Early Communication Behavior

Clark (1974) stated, "language does not develop 'in vacuo'; it develops with the functions of representing thoughts, precepts, and feelings. It is a communicative system, designed to convey what X might think, feel or see, to Y (p. 105)". If it is desirable to understand how language develops, one must explore the child's concomitant nonverbal behavior (Mehrabian, 1972). Researchers have approached this exploration from two avenues: examination of early cognitive and sensorimotor development and observation of early human interaction. Both approaches contain valuable information that help delineate early signal and pre-symbol behaviors as indicators of communicative behaivor.

The importance of early sensorimotor schemata to the development of language has been stressed by Sinclair (1971), Greenfield, Nelson and Saltzman (1972), Brown (1973) and Schlesinger (1974). These linguists recognize it is the actions the child associates with various tools (rattles, spoons, toys) that first represent his semantic understanding of the object. Brown (1973) suggested that the habitual action schema observed in a four to eight month old child when his rattle came into sight can be regarded as a nonverbal precursor of demonstratives. Brown also traced the precursors of nonexistence ("no more", "all gone") and location ("where") to sensorimotor schemata of anticipation, absence and object permanence.

Sinclair (1971) pointed to the skills the child acquires by the end of the sensorimotor period as directly related to certain aspects of the deep structures of grammar. Specifically, the child can: 1) order temporally and spatially which produces base structure; 2) use whole categories of objects for the same action which relates to major categories in the base; and 3) embed one action pattern into another which corresponds to the recursive rules of embedding in the base.

Slobin (1973) proposed that a child's language acquisition is based on his cognitive development. Morehead and Morehead (1974) elaborately tied the Piagetian substages of sensorimotor development to the various stages of language development and concluded that "the coordination of representational systems with advancing intellect should be central to language training even during the earliest stages of development. General coordination of systems seems to be an important operating principle found in both cognition and language—new forms first designate old content while new content initially appears in old forms (p. 185)".

The interaction bond between the child and the adults in his world has likewise received much attention as a salient variable in the development of child language. Birth signals the emergence of the infant from total participation in the life of one human into a world of humans. Physical attachment and interaction was as necessary for survival before birth as social attachment and interaction is for survival after birth. As a separated intentity, the infant must now communicate his survival needs through his overt actions. These action-signals must be understood and responded to by his caregivers. In these early exchanges are the beginnings of a communicative bond.

Much evidence exists supporting the attachment of the young for their mothers, not because of love, but because they feed them. In the case of the infant rhesus, Harlow (1958) demonstrated that the rhesus does not live by food alone and that other comforts and contacts are essential. An inanimate terrycloth mother substitute met some basic infant needs such as comfort, but failed to produce adult monkeys who were socially, sexually or maternally competent (Harlow & Suomi, 1970). Rheingold (1961) pointed out that in humans, visual contact rather than physical contact is at the basis of human sociability. This early visual contact is unquestionably significant to the mother in feeling that her infant is looking at her (Stone, Smith & Murphy, 1973). The impact of this normal process for later development was evidenced in a study by Freedman (1971) who reported a case of infant gaze aversion at six weeks of age; at two and one half years of age the child was diagnosed as autistic.

Wolff (1963) maintained that the human voice precedes the human face in eliciting smiling behavior as early as three weeks of age. These early sensory responses indicate the infant is using and learning through his active perceptual systems. Through attending to and processing stimuli the infant achieves joint action with the mother and that virtually leads him into language (Bruner, 1975).

Observations of both the sensorimotor schemas the child uses in manipulating objects and the patterns he uses in interacting with adults would appear to provide valuable information for determining a child's nonverbal communication skills. Grouping child-object and child-adult interactions into levels characterizing the major response patterns used during given developmental periods lends clarity to the emerging sequence

of symbolic behavior. However, it should be noted that these periods and ages are somewhat arbitrary and roughly defined. Children will develop some higher level skills before other lower level skills are clearly evident, however the grouping will provide a guideline for a systematic look at the emerging behavior.

Sensation Level. During the first three months of life the sense organs activate to stimuli with rapidly increasing degress of accuracy. Reactions remain peripheral and are in response to physical sensations. Wolff (1969) detected differential cries in response to hunger, anger and pain as early as the first month of life. This may represent the infant's first primitive effort to communicate to those around him. Vygotosky (cited in Zaporozhets & Elkonin, 1971) reported infants constantly orient themselves toward adults, turnig toward them to express emotions. Wolff (1963) observed that an infant cries when a person leaves his visual field yet ceases crying when the person reappears. Similarly, he ceases crying when he hears human voices. As early as nine weeks of age, the baby differentiates tactually, cries when held by someone other than his mom and will cease crying when taken by his mother (Bowlby, 1969).

The infant's reactions to objects are also indicative of early understandings that lead to communicative behavior. When his bottle, a light or other bright object is moved across his visual field, his eyes follow the movement through a 180 degree arc. His eyes will linger at the spot where the object was last seen. Fantz (1965) found evidence of discriminatory visual responses as early as two months of age. It appears that in response to both people and objects, the peripheral nervous system is highly functional and providing the infant increasing amounts of stimulation that will prepare him for more sophisticated responses.

Perceptual Level. Between four and seven months of age the infant begins to add meaning to sensation. When he is greeted by his mom, he responds with a smile and general bodily excitement. When his mom enters his visual field, he might raise his arms signifying "hold me". Ainsworth (1967) has described several behaviors indicating developing selectivity in the young infant. If held by someone else, he maintains visual attachment with his mother; he begins to respond differentially to adults by babbling more frequently in the presence of his mom than others; when held by his mom, he explores her person thus adding more information that will help him differentiate her; and when in a room with others, he will selectively crawl towards his mom. Bell (1970) has shown that the development of person-permanence preceded that of object permanence, an awareness that is clearly developing during this period.

When certain objects come into his visual field, he responds with predictable action patterns indicating he has acted upon the stimulus previously. He knows to grasp and shake his rattle, to anticipate food when he sees his mom preparing it. He may engage in the motor schemas associated with the visually present object before actually being given the object. An action bond is developing: the action signifys or represents the object; the child is formulating his meaning for the object which might later be represented by a single word. If the child sees part of a known object, he recognizes it and begins responding with its motor associations. If he loses a favorite toy he will search for it indicating knowledge of the desired object. Schaeffer (1963) observed that the infant's search for objects removed from his perceptual field began at the same time as the baby demonstrated being upset when separated from his mother.

Associative Level. Between eight and twelve months the child demonstrates he understands the relationship between certain events and what they mean. He becomes much more demonstrative and indicates his desires through many more actions. He can follow instructions from adults, such as "give Daddy a kiss", "wave bye-bye", etc. When asked for certain objects or toys, he can hand them to the adult. He attends to the adult communicating to him either orally or through gestures, aware that responses are expected of him. He does not like to be separated from his mom, and will protest if this happens. When his mother returns, he takes the initiative in greeting her (Ainsworth, 1967). He communicates his desires by tugging at her, or placing her hand on objects and pushing.

With toys and objects, he is likely to intentionally manipulate them in an exploratory manner, attempting to gather more information about them. He knows that his objects can disappear yet not be lost forever. He will pursue them under some circumstances.

Imagery Level. Between twelve and eighteen months the beginnings of experimentation occur. The infant finds new ways to relate to both people and objects. If the child wants an adult to repeat an action, he will signal this in some manner, such as giving the object back to the adult, or looking at the point of action initiation, then looking at the adult. Frequently he will just wait patiently for the adult to act. He tries to modify his actions, both verbal and nonverbal, in order to reproduce more exact correspondences to modeled behavior.

During this period the important schema of pointing emerges. If the child cannot reach an object, he will get near the object, point in the direction of the object, then look at the adult. This is important because

the child is communicating about an object not in direct contact with his body. The image of the desired object is in his mind and he communicates about the image knowing that his mom understands his desire. Someday a word or sign might represent that image.

His interaction with objects is also indicative of his increasing ability to represent his world. He will search for objects in the last place he saw them; he anticipates what will happend to objects under certain circumstances. He experiements with objects to discover their properties. He is anxious to respond discriminatively toward objects, either by learning words to represent them, or by associating actions or gestures with objects. Objects, events and experiences most salient for the child will be those about which he first communicates.

Symbolic Level. Between 18 and 24 months of age the child's communication patterns take on representation that can lead to symbolism. The infant can represent an object, event or experience in his mind and use that information in formulating actions. To communicate to his mom his desire to go outside he might bring her his coat and hat; to tell her he is hungry he might get the jar of peanut butter and sit at his designated place at the dinner table. The nonverbal child learns to use the same gesture to represent the behavior or event that others use, no longer relying on his own gesture or indicator. These early signs are most likely to be natural signs that are outgrowths of the motor schemas associated with objects and events. As he moves ahead, he begins using learned signs for which the motivation for its use is not obvious. At this point, the sign becomes a symbol and is comparable to using words for which the origin in unknown.

In play with objects, the child demonstrates an awareness of the adult's use of the objects. He has seen an adult act in a certain manner with an object and w ll recall the event and replicate the motor patterns. He pretends in play and imitates previously witnessed behavior (Morehead & Morehead, 1974).

At this point the child can now communicate to those around him in ways that others will understand. When he communicates about events that no longer simply satisfy a physical pleasure, but communicates to share a happening or desire, then he is using language, symbols to represent ideas, events and experiences that others understand and use.

The communication levels described above are useful in determining how a child is using his developing cognitive and sensory motor schemas to acquire signal and symbolic forms of communication. The sequential progressions described should prove helpful in suggesting language building activities that can be included in his daily interactions with objects and caregivers in his world. By building in these prelinguistic behaviors, before attempting to program higher ordered skills, a sounder base for later language learning is established.

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